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EDWARDS ANGELL PALMER & DODGE LLP
P.O. BOX 55874
BOSTON, MA 02205

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HIROTOSHI TAKEMORI,
KAZUNORI MATSUBARA, and TOSHIKAZU NAGAURA

Appeal 2008-0133
Application 09/756,493
Technology Center 2600

Decided: May 23, 2008

Before KENNETH W. HAIRSTON, CARLA M. KRIVAK,
and KEVIN F. TURNER, *Administrative Patent Judges*.

HAIRSTON, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant seeks our review under 35 U.S.C. § 134 of the Examiner's final rejection of claims 1 and 3-11. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

INVENTION

Appellants' claimed invention is to an optical pickup used in an apparatus for optically recording information (Spec. 1:5-7). The integrated unit according to the present invention includes a laser beam source for emitting a laser beam, a detecting portion for detecting reflected light, a diffraction element for diffracting the laser beam, and a casing accommodating the laser beam source and the detecting portion, wherein the diffraction element and the casing are integrated, and wherein the integrated unit and an optical compensation film are integrated (Spec. 5:10-15).

Claim 1 reproduced below is representative of the subject matter on appeal:

1. An integrated unit, comprising:

a laser beam source for emitting a laser beam;

a detecting portion for detecting reflection of said emitted laser beam;

optical elements for controlling the pathways defined by said emitted laser beam and said reflection thereof, said optical elements including at least a diffraction element for diffracting said emitted laser beam and said reflection thereof;

a casing accommodating said laser beam source and said detecting portion; and

a transparent optical compensation film for circularizing the polarization of light passing therethrough such that light exiting therefrom is circularly or elliptically polarized, said transparent optical compensation film (i) comprising a single layer polyolefin-type polymer film characterized by a first type of film index ellipsoid, said single layer polyolefin-type polymer film characterized by said first type of film index ellipsoid having been formed by uniaxially stretching or biaxially stretching a single layer polyolefin-type polymer film characterized by a film, index ellipsoid of a different type from said first type of film index ellipsoid such that said film index ellipsoid of said different type from said first type of film index ellipsoid is changed into said first type of film index ellipsoid by said uniaxial or biaxial stretching, and (ii) being formed integrally with one of said optical elements or with an end of said casing so as to be disposed in said optical pathways defined by said emitted laser beam and said reflection thereof.

THE REJECTION

The Examiner relies upon the following as evidence of unpatentability:

Mori	US 4,400,062	Aug. 23, 1983
Kay	US 5,544,143	Aug. 06, 1996
Nakao	US 6,272,097 B1	Aug. 07, 2001 (filled May 18, 1999)

The following rejection is before us for review:

Claims 1 and 3-11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kay in view of Nakao and Mori.

OBVIOUSNESS

There are multiple obviousness issues before us regarding whether Appellants have shown that the Examiner erred in rejecting claims 1 and 3-11 under 35 U.S.C. § 103(a).

We present these issues as they correspond to, and in the order of, Appellants' presented arguments.

A. The first issue is whether the combination of Kay and Nakao teach an optical compensation film.

B. The second issue is whether Nakao teaches a compensation element that is a film.

C. The third issue is whether Mori teaches a single layer polyolefin-type polymer film characterized by a first type of film index ellipsoid formed by uniaxially or biaxially stretching a polyolefin-type polymer film characterized by a film index ellipsoid of a different type.

FINDINGS OF FACT

The relevant facts include the following:

1. Kay teaches a laser-detector-grating unit (LDGU) combining several optical components into a single package (col. 4, ll. 35-37).
2. Kay teaches that a transparent substrate 34 is arranged between an optical source 40 and an optical storage medium such that the radiation beam passes through the substrate (col. 4, ll. 52-54).
3. Kay further teaches that a zeroth order diffraction component of the radiation beam passes undeflected through the transparent substrate 34 and

the grating beam splitter 42 formed thereon and is collimated by the collimating lens 44 (col. 4, ll. 54-58).

4. Kay teaches that the radiation beam is focused by an objective lens 52 onto an optical storage medium 56 (col. 4, ll. 58-60).
5. Kay further teaches that a quarter-wave plate (i.e., compensation element) may be arranged between collimating lens 44 and objective lens 52 to provide circular polarization to the radiation beam (col. 4, l. 64-col. 5, l. 2).
6. Nakao teaches a second transparent layer forming a phase difference generating element 7 (i.e., transparent compensation film) (Figure 1 and col. 4, ll. 14-16) which provides circular polarization (col. 4, ll. 44-47).
7. Nakao teaches that the second transparent layer 7 (i.e., transparent compensation film) is integrated with the diffraction grating 5 (i.e., diffraction element) and the second transparent layer 6 among other elements (Figure 1 and col. 4, ll. 34-47).
8. Nakao further teaches that the integration of the components by a simple manufacturing process results in a minute device (Abstract).
9. Nakao teaches a layer 7 as shown in Figure 1 at the lower surface 6a of the second transparent layer 6 (Figure 1 and col. 4, ll. 12-16).
10. Nakao teaches layer 7 which is a phase difference generating element for circularizing the polarized light therethrough (col. 4, ll. 44-47).
11. The definition of film is: "a very thin sheet of something" or a "thin layer." (*Encarta® World English Dictionary, North American Edition*, http://encarta.msn.com/encnet/features/dictionary/DictionaryResults.aspx?refid=1861611459 (last visited May 09, 2008)).

12. Appellants' specification describes the formation of an optical compensation film by uniaxial or biaxial stretching of a normal polymer film having a birefringence distribution (Spec. 5, ll. 18-31).

13. Appellants' specification states:

> More specifically, the optical compensation film according to the present invention can be formed by subjecting to plastic forming such as uniaxial stretching or biaxial stretching a high polymer of polyolefin-type that is even and has little deformation. Moreover, the present optical compensation film has a prescribed birefringence distribution. The polymer member having even molecular orientation with a birefringence that is at most 10 nm is subjected to high accuracy stretching operation in the uniaxial or biaxial direction, thereby causing displacement in the molecular orientation, which results in the optical film attaining optical anisotropy. Fig. 12 shows the models of index ellipsoids before and after the stretching operation. If planar refractive index is represented by nx, ny, and the refractive index in the thickness direction is represented by nz, $nx>ny\geq nz$ would be established for the optical compensation film formed by stretching of a normal polymer film.

Spec. 5:18-31.

14. Mori teaches, in the background of the invention, a single layer polypropylene film having birefringent properties (i.e., first type of index ellipsoid) which can be used to make a ¼ or ½ wavelength plate (i.e., different type film index ellipsoid) (col. 1, ll. 22-24) when stretched in a longitudinal direction (i.e., uniaxial direction) (col. 1, ll. 27-33) by selecting the thickness of the high molecular film (col. 1, ll. 43-48).

15. Mori teaches that the layer is not always uniform because of the difficulty of controlling the thickness of the stretched material as stated in the background of the invention (col. 1, ll. 49-56) which is the problem that Mori tries to address with his multilayer stack (col. 2, ll. 6-17).
16. Appellants' claim 1 is silent as to the layer having a uniform thickness.
17. Appellants concede to the Examiner's product-by-process argument that the claim must be determined by the product itself and not the actual process and that an old product produced by a new method is not patentable whether claimed by "product-by-process" (Br. 20).

PRINCIPLES OF LAW

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). *See also KSR*, 127 S. Ct. at 1734 ("While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.")

Where the claimed subject matter is no more than "the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for improvement," and, the combination does no more than yield predictable results, the claim is unpatentable under 35 U.S.C. 103(a). *KSR v. Teleflex*, 127 S. Ct. at 1740. Furthermore, where the claimed subject matter is a combination that only unites old elements with no change in their respective established functions, and the combination yields predictable results, the claim is unpatentable as obvious under 35 U.S.C. 103(a). *Id.*

"The diversity of inventive pursuits and of modern technology counsels against confining the obviousness analysis by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasizing the importance of published articles and the explicit content of issued patents." *KSR v. Teleflex*, 127 S. Ct. at 1731-32. "Rigid preventative rules that deny factfinders recourse to common sense . . . are neither necessary . . . nor consistent" with our case law. *Id.* 1742-43.

The Examiner bears the initial burden of presenting a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). If that burden is met, then the burden shifts to the Appellant to overcome the prima facie case with argument and/or evidence. (*See id.*)

The Examiner's "articulated reasoning . . . in the rejection must possess a rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). The Supreme Court, citing *In re Kahn*, 441 F.3d at 988, stated that "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with

some rational underpinning to support the legal conclusion of obviousness." *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. at 1741. However, "the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *Id.*

"One cannot show nonobviousness by attacking references individually where . . . the rejections are based on combinations of references." *In re Keller*, 642 F.2d 413, 426 (CCPA 1981). The test of obviousness is what the "combined teachings . . . would have suggested to those of ordinary skill in the art." *Id.* at 425.

Although claims are interpreted in light of the specification, limitations from the specification are not read into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

A structurally different element performing the same function as a prior art element, "albeit in a different environment," is not patentable. *Ryco, Inc. v. Ag-Bag Corp.*, 857 F.2d 1418, 1425 (Fed. Cir. 1988).

ANALYSIS

We address Appellants' arguments in the order they were presented. Claims 1 and 3-11 were argued as a group with claim 1 as representative (Br. 15-22).[1]

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[1] Only arguments made by Appellants have been considered in this decision. Arguments, which Appellants could have made but did not make in the Brief, have not been considered and are deemed waived. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2004).

A. Does the combination of Kay and Nakao teach an optical compensation film?

Appellants argue that "[t]here is absolutely no teaching, disclosure or suggestion anywhere in the Kay, et al. reference that the transparent substrate 34 is contemplated to be an optical compensation film or for that matter to in any way evidence a compensation function" (Br. 15). Appellants further argue that Kay does not teach "that a compensation film integrated with another element of the device will accomplish the required compensation function with fewer components in a smaller unit with less required adjustment as taught by the present invention" (Br. 16).

The Examiner responds that "one cannot show nonobviousness by attacking references individually where . . . the rejections are based on combinations of references." *In re Keller*, 642 F.2d at 426. The Examiner further responds that in this case, Kay discloses using a transparent optical compensation film in order for a zeroth order diffraction component of the light beam to pass undeflected therethrough (Ans. 12). The Examiner further states that Kay also integrates the compensation film with other elements (Ans. 12). The Examiner states that Kay expresses the desirability of circularizing the polarization of light passing therethrough such that light exiting therefrom is circularly or elliptically polarized, but does not expressly disclose that the transparent optical compensation film circularizes the polarization of light passing therethrough (Ans. 12).

The Examiner further states that Nakao discloses the well-known feature in the art of an integrated unit having an optical single layer compensation film formed integrally with other optical elements for circularizing the polarization of

light passing therethrough such that light exiting therefrom is circularly polarized (Ans. 12-13).

The Examiner articulated as a motivation to combine Kay and Nakao that including the compensation film integrally would circularize the polarization of light passing therethrough resulting in a small integrated unit by using a simple manufacturing process as suggested by Nakao (Ans. 4).

We agree with the Examiner's findings of facts and conclusions as set out in the Answer and adopt them as our own. We add the following primarily for emphasis.

Kay teaches a laser-detector-grating unit (LDGU) combining several optical components into a single package (Finding of Fact 1). Kay teaches that a transparent substrate 34 is arranged between the optical source 40 and an optical storage medium such that the radiation beam passes through the substrate (Finding of Fact 2). Kay further teaches that a zeroth order diffraction component of the radiation beam passes undeflected through the transparent substrate 34 and the grating beam splitter 42 formed thereon and is collimated by the collimating lens 44 (Finding of Fact 3). Kay teaches that the radiation beam is focused by an objective lens 52 onto an optical storage medium 56 (Finding of Fact 4). Kay further teaches that a quarter-wave plate (i.e., compensation element) may be arranged between collimating lens 44 and objective lens 52 to provide circular polarization to the radiation beam (Finding of Fact 5).

Nakao teaches a second transparent layer forming a phase difference generating element 7 (i.e., transparent compensation film) which provides circular polarization (Finding of Fact 6). Nakao teaches that the second transparent layer 7

(i.e., transparent compensation film) is integrated with the diffraction grating 5 (i.e., diffraction element) and the second transparent layer 6 among other elements (Finding of Fact 7). Nakao further teaches that the integration of the components by a simple manufacturing process results in a minute device (Finding of Fact 8). As stated *supra*, "rigid preventative rules that deny factfinders recourse to common sense . . . are neither necessary . . . nor consistent with" our case law. *KSR*, 127 S. Ct. at 1742-43. Thus, common sense dictates that integration of any of the components (i.e., the diffraction element with the transparent compensation film) by the simple manufacturing process, as suggested by Nakao, would result in a smaller device.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to have modified Kay and incorporated the diffraction element and the transparent compensation film as taught by Nakao, substituting Kay's transparent substrate having a diffraction element and a separate wave plate (i.e., compensation element), thereby, providing for a smaller device.

Thus, we are not persuaded by Appellants' argument because the combination of the Kay and Nakao references teaches an optical compensation film.

B. Does Nakao teach a compensation element that is a film?

Appellants argue that "while in Nakao et al the compensation element is moved from outside the 'integrated unit' as in Kay et al into the 'integrated unit' therein disclosed, there remains no clear indication in either Kay et al or Nakao et al that the compensation element is, or could be or should be, a film, much less a compensation film as herein claimed" (Br. 17). The Examiner states that Nakao

discloses a compensation layer 7 for circularizing the polarization of light passing therethrough such that light exiting therefrom is circularly or elliptically polarized, which performs the same function as claimed (Ans. 13). The Examiner further articulated that it would have been obvious to one skilled in the art at the time that the invention was made to integrally include the compensation film as a layer to circularize polarization of light passing therethrough in order to obtain a small integrated unit by a simple manufacturing process as suggested by Nakao (Ans. 13).

We agree with the Examiner's findings of facts and conclusions as set out in the Answer and adopt them as our own. We add the following primarily for emphasis.

Nakao teaches a layer 7 as shown in Figure 1 at the lower surface 6a of the second transparent layer 6 (Finding of Fact 9). Layer 7 is a phase difference generating element for circularizing the polarized light therethrough (Finding of Fact 10). The definition of film is: "a very thin sheet of something" or a "thin layer" (Finding of Fact 11). Thus, Nakao's integrated compensation layer constitutes an integrated compensation film.

However, even if Nakao does not teach a film but only a compensation element 7 integrated with a transparent layer 6, it would nonetheless, constitute a functional equivalent having the same function of circularizing the polarized light passing therethrough (Findings of Fact 9 and 10). As stated *supra*, a structurally different element performing the same function as a prior art element, albeit in a different environment, is not patentable. *Ryco, Inc. v. Ag-Bag Corp.*, 857 F.2d 1418, 1425 (Fed. Cir. 1988).

Finally, as stated *supra*, "one cannot show nonobviousness by attacking references individually where . . . the rejections are based on combinations of references." *In re Keller*, 642 F.2d at 426. The Examiner also used Mori which clearly teaches the use of a compensation film (Findings of Fact 12-14). Thus, the substitution of the known elements of a compensation element 7 integrated with a transparent layer 6 with the functional equivalent compensation film as taught by Mori would have been an obvious modification providing for the predictable result of a smaller device.

Thus, we are not persuaded by Appellants' argument because Nakao teaches a compensation film or at a very minimum a functional equivalent of a compensation film. Furthermore, the rejection is based on a combination of references and the Mori reference clearly teaches the use of a compensation film.

C. *Does Mori teach a single layer polyolefin-type polymer film characterized by a first type of film index ellipsoid formed by uniaxially or biaxially stretching a polyolefin-type polymer film characterized by a film index ellipsoid of a different type?*

Appellants argue that "the Mori et al film that has been uniaxially stretched by the elongation roller is specifically indicated by Mori, et al to be unsuitable for use as a compensation film in an optical pickup device wherein a circularization of incoming linearly polarized light beam is required. Instead, Mori et a1 discloses that the uniaxially stretched film can be utilized as a compensation film in an optical pickup device such as that herein claimed only if the film is cut into pieces which are then stacked one atop the other with the optical axis of the respective layers oriented at angles to one another resulting in the circularizing effects on

incoming linearly polarized light that are desired" (Br. 18). Appellants further argue the following:

> the film utilized by Mori, et al in the fabrication of his *stacked* waveplate structure is composed of *a plurality of layers of film* that have only the 'different type' film index ellipsoid type (i.e., the as manufactured type, that is 'starting type', of film index ellipsoid referred to in the claims of this application). In other words, the Mori film is given a film ellipsoid type during its manufacture that corresponds to the film ellipsoid type of the claimed film *prior to the subsequent uniaxial or biaxial stretching presently claimed for the purpose of changing the original film ellipsoid type (the 'different' ellipsoid type) to another film ellipsoid type (the claimed 'first' film ellipsoid type)*. There is no indication in Mori et al that tends to teach, disclose or suggest that the initially uniaxially stretched film should be subjected to any further stretching whether such be uniaxial or biaxial. In addition, Appellant respectfully submits that it is unambiguously clear that if the Mori et al film were to be subjected to further stretching as herein claimed its molecular structure would not be the same as that of the Mori et al composite stacked compensation film structure (emphasis in the original).

(Br. 19).

The Examiner responds that the disputed claim limitation only requires that the first index ellipsoid is formed by uniaxially or biaxially stretching, and there is no mention of any further or additional stretching performed to the single layer polyeolefin-type (polypropylene) polymer film to obtain a different type of film index ellipsoid (Ans. 14). The Examiner states that Appellants' own specification (Spec. 5:18-31) discloses that the uniaxial or biaxial stretching is performed to the

original plastic material of a normal film, with no mention of any preliminary stretching having been performed (Ans. 14). The Examiner finds that Mori discloses a high polymer film, that is in fact a birefringent material, having different refractive indexes or index ellipsoids (Ans. 15). By controlling the stretching, the single layer polyolefin-type film obtains the desired index ellipsoid (first type index ellipsoid) that accomplishes the desired compensation function for example 1/4 phase or 1/2 phase wave plate (Ans. 15). Furthermore, with respect to Appellants' references to Mori's preferred embodiment of a stacked waveplate, the Examiner clarifies that the rejection only relied on the single layer embodiment as described in the background of the invention, col. 1, ll. 5-60, which is structurally and functionally the same as the claimed single layer (Ans. 16).

We agree with the Examiner's findings of facts and conclusions as set out in the Answer and adopt them as our own. We add the following primarily for emphasis.

Appellants' specification describes the formation of an optical compensation film by uniaxial or biaxial stretching of a normal polymer film having a birefringence distribution (Finding of Fact 12). More specifically, the relevant portion of Appellants' specification states:

> More specifically, the optical compensation film according to the present invention can be formed by subjecting to plastic forming such as uniaxial stretching or biaxial stretching a high polymer of polyolefin-type that is even and has little deformation. Moreover, the present optical compensation film has a prescribed birefringence distribution. The polymer member having even molecular orientation with a birefringence that is at most 10 nm is subjected to high accuracy stretching

> operation in the uniaxial or biaxial direction, thereby causing displacement in the molecular orientation, which results in the optical film attaining optical anisotropy. Fig. 12 shows the models of index ellipsoids before and after the stretching operation. If planar refractive index is represented by nx, ny, and the refractive index in the thickness direction is represented by nz, nx>ny≥nz would be established for the optical compensation film formed by stretching of a normal polymer film.
> Spec. 5:18-31 (Finding of Fact 13).

Thus, the claimed single layer polyolefin-type polymer of a different type film index ellipsoid formed by uniaxial or biaxial stretching of a first type of film index ellipsoid (claim 1) is simply created by uniaxial or biaxial stretching of a normal polymer film (Finding of Fact 12).

Similarly, Mori teaches in the background of the invention, a single layer polypropylene film having birefringent properties (i.e., first type of index ellipsoid) which can be used to make a ¼ or ½ wavelength plate (i.e., different type film index ellipsoid) when stretched in longitudinal direction (i.e., uniaxial direction) by selecting the thickness of the high molecular film (Finding of Fact 14). The fact that the layer is not always uniform because of the difficulty of controlling the thickness of the stretched material, as stated in the background of the invention, and which is the problem that Mori tries to address with his multilayer stack (Finding of Fact 15), does not matter, especially in view of the fact that the Appellants claim only a single layer polypropylene film which has its index ellipsoid changed by uniaxial stretching. Note that claim 1 is silent as to the layer having a uniform thickness (Finding of Fact 16). The Examiner used Mori's single

layer of propylene film embodiment which meets the claim limitations and not Mori's multi-layer stack embodiment (Ans. 16).

Thus, we are not persuaded by Appellants' argument because Mori's stretched birefringent single layer of propylene film to create a ¼ or ½ wavelength plate (Finding of Fact 14) reads on the limitation of a single layer polyolefin-type polymer of a different type film index ellipsoid formed by uniaxial or biaxial stretching of a first type of film index ellipsoid.

Appellants' additional arguments regarding the requirements of additional stretching and the disposition of the optical axes (Br. 20) are not persuasive as the birefringent single layer polypropylene layer stretched in the longitudinal direction (i.e., uniaxial direction) to create a ¼ or ½ wavelength plate as taught by Mori (Finding of Fact 14) constitutes a sufficient teaching to meet the claimed limitation.

For the foregoing reasons, we find that the Examiner did not err in rejecting claims 1 and 3-11 under 35 U.S.C. § 103(a).

CONCLUSIONS OF LAW

We conclude that the Appellants have not shown that the Examiner erred in rejecting claims 1 and 3-11 under 35 U.S.C. § 103(a).

DECISION

The decision of the Examiner to reject claims 1 and 3-11 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

KIS

EDWARDS & ANGELL, LLP
P.O. BOX 55874
BOSTON, MA 02205